# Default Report

*Delaware Data Survey*

**December 28th 2020, 12:06 pm EST**

## User Profile Responses

**Q4 - Your GIS Role - Select which one suits your duties best.**

| # | Answer | % | Count |
|---|---|---|---|
| 1 | GIS Manager - Oversee staff and budget | 16.00% | 12 |
| 2 | GIS Developer - create applications and do some coding | 8.00% | 6 |
| 3 | GIS Technician - use GIS regularly using a variety of software and solutions | 22.67% | 17 |
| 4 | GIS General User - use GIS semi-regularly or applications/tasks created by others | 45.33% | 34 |
| 5 | Other (specify) | 8.00% | 6 |
| | Total | 100% | 75 |

## Q4_5_TEXT - Other (specify)

| | |
|---|---|
| I'm all of the above depending on the year - currently "GIS Manager" fits me best, but that is not always the case... | State GIS Specialist |
| 911\GIS Coordinator | Geologist |
| GIS Developer and GIS Technician duties | Tech/dev/Mgr roles depending on the month and year |

# Aerial Imagery Data Question Responses

## Q5 - Do you utilize ANY aerial imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 94.20% | 65 |
| 2 | No | 5.80% | 4 |
| | Total | 100% | 69 |

## Q7 - Which Imagery products do you utilize?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Statewide Imagery served on FirstMap | 36.92% | 24 |
| 2 | Other Imagery products | 6.15% | 4 |
| 3 | Combination of Statewide and other products | 56.92% | 37 |
| | Total | 100% | 65 |

## Q8 - If yes, What other imagery sources do you utilize?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | UAV (Unmanned Aerial Vehicle) | 21.57% | 11 |
| 2 | Satellite | 49.02% | 25 |
| 3 | Other (specify) | 29.41% | 15 |
| | Total | 100% | 51 |

## Q8 - Other imagery sources used (specify)

| | |
|---|---|
| non-satellite-based photographs | Lidar |
| google earth/maps (2 responses) | DGS aerials |
| Pictometry | 1977 Orthos not served on First Map |
| Aerial from NCC | Street view |
| Original Tax Ditch Maps | NAIP |
| I sometimes use imagery on FOSS like QGIS. | NearMap product |
| Imagery flown by Dover AFB. | |

## Q9 - What is the reason for using other imagery sources?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Statewide data not current/frequent enough | 36.00% | 18 |
| 2 | Special Program/Project need | 34.00% | 17 |
| 3 | Other (specify) | 30.00% | 15 |
| | Total | 100% | 50 |

## Q9 – Other reason for using other imagery (specify)

| | |
|---|---|
| I work across multiple states and thus find national resources easier and more familiar. I use state when they go beyond national availability, though. | No special reason, just another option to utilize |
| Like the clear image, 3D, and street view image | Easy to use, it's free, and I use it for my Non-Profit work not associated with DelDOT |
| Oblique Imagery | more information provided |
| Multispectral imagery | for alternative views/ changes in vegetation |
| Available and current | speed of rendering is quicker inhouse |
| It's localized and very current | Used sparingly for time-step interpretation |
| we use them to look up historical work on pavement, pavement work often an indicator for water assets work | UAV imagery for higher res, real-time aerial data |

## Q10 - What vendor provides this aerial imagery product?

| | |
|---|---|
| Bing | it is created by DNREC |
| DGS | Maxar/DigitalGlobe |
| DNREC | NASA, ESA |
| Eagleview/Pictometry (4 responses) | NearMap provides high-resolution aerial imagery, we had them as a trial version. USGS provides 2 feet cell-resolution but outdated from 2013 |
| ESA Sentinel 2 | New Castle County (2 responses) |
| ESRI (3 responses) | NOAA (2 responses) |
| Federal and academic organizations | Unknown - most images are not georeferenced |
| Flown by the Delaware Drone Taskforce | USDA NAIP (3 responses) |
| GIS Clearinghouse | USGS |
| Google (11 responses) | various vendors for nationwide acquisition |

| | |
|---|---|
| I currently mainly use Earth Explorer for downloading photographs and Google Earth for some uses. | We are the original source. Scanned and georeferenced in-house. |
| received it from Dover AFB. | We collect our own UAV imagery |

## Q11 - What is your preferred frequency of updating imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yearly | 47.69% | 31 |
| 2 | 2 year interval | 32.31% | 21 |
| 3 | 3 year interval | 12.31% | 8 |
| 4 | 4 year interval | 0.00% | 0 |
| 5 | 5 year interval | 7.69% | 5 |
| | Total | 100% | 65 |

## Q12 - What is your preferred resolution of Aerial Imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | 1 meter | 26.15% | 17 |
| 2 | 0.5 meter | 26.15% | 17 |
| 3 | 0.25 meter | 33.85% | 22 |
| 4 | Other (specify) | 13.85% | 9 |
| | Total | 100% | 65 |

Q12 – Other preferred resolution (specify)

| |
|---|
| slightly coarser is okay |
| less than .25 meter |
| 6 INCH |
| The best resolution available for that particular imagery dataset |
| It does not matter. |
| As fine as possible |
| not important with my work |
| best available, this question does not apply to satellite imagery |

## Q13 - Does your use require, or is it enhanced by, the 4th band (currently this is the near-infrared band) for imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 29.23% | 19 |
| 2 | No | 70.77% | 46 |
| | Total | 100% | 65 |

## Q14 - How do you utilize the near-infrared or 4th band in the imagery?

| | |
|---|---|
| Vegetation and other spectral indices | Vegetation |
| Will use in near future to help categorize LIDAR data for vegetation types. | Plant identification |
| We've been asked to make the near infrared photography available as a service by other agencies. | Habitat delineation |
| You can manipulate the 4th band to show forest health which I could use for my Non-Profit group | We do a fair amount of crop loss studies. |
| Identification of vegetation type, remote sensing of wildlife habitat | Mapping, Elevation |
| Remote analysis of vegetation cover (and in fact we use even more bands than those 4) | NDVI assessment |
| seperate pine or broadleaved evergreens from other vegetation. | mapping, water bodies, vegetation, other land-cover types |
| 4th band is useful in bringing up vegetation color, we often use that in the classification process, and to see where in the city the grid lines are covered by the trees, and need to be trimed before winter . | I compare land elevations |
| Habitat assessment | soil moisture |

## Q15 - Do you require Leaf-off Imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 56.92% | 37 |
| 2 | No | 43.08% | 28 |
| | Total | 100% | 65 |

## Q16 - Reason for needing Leaf-off

| | |
|---|---|
| For my current use, I benefit from both - I am interested in seeing vegetation (in wetlands) that is sometimes under tree canopies, but I need it to be during growing season (so often am most interested in late spring sorts of timing). | from my experience, leaf-on imagery has a higher shadow impact, with the shadow covering the pavement, it makes it harder to tell where are the new and the old pavement in the city. |
| We often use the imagery to identify features and assets on the ground. Many of these are obscured during leaf-on. | wetland identification |
| Determining existence of buildings and structures under lead cover | Obstruction relief |
| identify buildings under tree cover | Easier to view woodland pool habitat |
| Not required, but seems leaf off is better for surface feature visibility. Maybe lidar gets us around that? | We count manufactured housing in mobile home parks which are often wooded. |
| Availability to see structures | Ground Elevation/View |
| To have better view of the structures on the ground. | land cover assessment |
| Better to see tax ditch channels and Right-Of-Way conditions | To see all structures and activities on proprieties. |
| GROUND COVER/ASSESSMENT OF STRUCTURES | Work with tax ditches and they are often in wooded areas. |
| Wetland determinations, so we can see through the tree canopy, because some of our wetlands are in wooded areas. | to visualize land surface better |
| seeing homes structures etc | Use imagery for wetlands. Much less tree shading with leaf-off, which allows for more accurate detection of wet signatures. |
| We server data for other state agencies to use. While I do not have a direct business need for leaf off, many who we support by providing image services require leaf off. | To see ground surface to identify impervious vs pervious areas. |
| Easier to see buildings and such | viewing landscape features better (eg. wetlands) |
| Locating sub meter assets, (Water, Wastewater and Electric). | Base cartographic mapping needs to "see" roads, streams, buildings obscured by leaves. |
| to see what the ground looks like under the canopy | |
| I have a need to see the ground to find wetlands or other hydrological features. | The ability to locate assets. |
| determine changes to buildings and structures, location of new construction | Better for certain applications I may need to use |
| leaf off aids in observing wetland habitats and vegetation changes (evergreen vs deciduous). leaf also shows habitats during wetter seasons. | Covertype differentiation |
| surface conditions | Search for isolated wetlands |

## Q17 - Does your use require the images to be free of obstruction by smoke, cloud cover, haze and snow cover?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 86.15% | 56 |
| 2 | No | 13.85% | 9 |
| | Total | 100% | 65 |

## Q18 - Explain why your program requires these environmental features should not be present in the imagery.

| | |
|---|---|
| for seeing vegetation | To observe areas surrounding aquaculture sites |
| We use the imagery to identify features and assets on the ground to update datasets. Negative environmental features obscure the view. | It prevents me from identifying isolated wetlands and potential rare plant habitat |
| Need to see details of changes in tax parcels/land use and road improvements, including lane markings at intersections. | To be able to define land practices. |
| Identification of buildings and other locations. | Use the imagery to look at what is on the ground |
| Used for details on pavement. Snow cover would be particularly bad. It would to a large part depend on how dense the fog or clouds are | Mainly cloud cover obstructing views |
| Some obstruction is fine but none is ideal. If using a spectral index like NDVI for some sort of statistical modeling you want to maximize spatial coverage. | Used primarily for identifying potential drilling locations, clearest images possible assist. |
| Again not required, but nice if we have clear view imagery. | May cover potential habitat |
| If leaf is on than you can have shadows so the buildings and structures on the ground can be obscured. Sometimes we use the imagery and count structures or determine the land use. | Require a clear view of land cover conditions |
| Better to see tax ditch channels and Right-of-Way conditions | Need clear view of impervious surfaces, vegetation, etc. sometimes on relatively small parcels. |
| Easier to view change over time and what is happening on the ground | We are counting structures, observing ground disturbance etc. |
| We need a clear crisp image, because our measurements have to be precise, with these wetlands. That's how these landowners will get paid, by the foot/acre...etc | Clearly show ground cover |
| Ideally imagery would not have these things particularly for shadowing. | Assessment of pET requires less than 5-10 % cloud cover |

| | |
|---|---|
| We use imagery to visually assess conditions on the ground, such as land use and presence of structures. Cloud cover would obscure this. | We use the aerial image to help with locating our utilities in the field and for designing installations of new utilities. |
| We server data for other state agencies to use. While I do not have a direct business need for obstruction free photography,   many who use FirstMap image services need photography that is free from obstruction.  These users utilize the photography for analysis and in lieu of site visits. Obstruction could render the photography useless in some areas. | We need to be able to see everything in the image clearly to detect wetlands for updating state wetland maps and assessing wetland acreage trends. It is also important to be able to see everything clearly for accurate desktop planning to prepare for fieldwork. |
| For accuracy in viewing various transportation assets. | Same as above; we need to be able to see everything that is on a property. |
| Clearer image of building | Sometimes looking at community-level trends in development |
| User/field staff visually locating objects from mobile devices. | It impairs visibility. |
| they would likely conceal ground features | Used for habitat visualization and to determine ground cover |
| The clearer the imagery the better end products I can create. | to visualize ground surface clearly |
| We are trying to analyze what's right on the ground, which would be blocked | Discrete and subtle changes in habitat variation |
| It makes it hard to see if the site is active or not. | We use imagery for regulatory purposes.  We permit structures in relation to a building restriction line. Knowing what exists and within proximity to the line is critical. |
| Need detailed coverage of all forests. | Ideally, we need to verify impervious vs pervious surfaces when reviewing stormwater runoff calculations |
| we need to look at all areas to assess probability of archaeological sites, and to assess changes to historic buildings and landscapes | to best view landscape features |
| shows a clear picture. | base cartographic mapping |
| Need to be able to identify the habitat to know if it is suitable | we are focusing more on observing the city's assets on the ground, therefore, we prefer to utilize products that do not have atmospheric obstructions. |
| accuracy | The ability to see what's on the ground. |
| we use imagery to delineate geomorphic feature boundaries - like shorelines and dune lines | We use imagery for identifying front doors, and building structures. |
| Obstruct the accuracy | |

## Q19 - Is there an acceptable percentage of partial obstruction that would still be acceptable? (i.e. less than 5% of an image can be obscured by … and still be acceptable.)

| | |
|---|---|
| Ideally 1% or less would be fantastic (2 responses) | less than 50% |
| Very little if any.  Less than 2% | As long as coastal communities are visible, its acceptable |
| less than 3 percent. | I don't know what an acceptable percentage would be.  I would rely on the judgement by the experts involved. |
| Less than 5% (10 responses) | I imagine so, but am not sure what that percentage would be....fairly low I would hope. |
| 5% is acceptable (8 responses) | I'll use whatever I get but the clearer, the better. |
| 5%-10% obstruction would still be acceptable (3 responses) | No (9 responses) |
| 10% obstruction (2 responses) | sure |
| 15% obstruction (1 response) | The less obstructions the better. |
| less than 15% | Whatever the State used or received for the 2017 Aerials was good. |
| Yes - we'll take any imagery we can get. The lower the obstruction the better, but we could use it regardless. | When I request satellite imagery I set my cloud criteria to 10%.  Now and then I get one cloud in the wrong spot but usually that works. |
| yes, but no specific cutoff.  Possibly somewhat high, since I'm interested in smaller features within a view. | yes, partial obstructions are acceptable. I am not looking at images for precise data collections, more so observing changes over time. |
| Yes, I suppose a small obstruction would be okay. | |

## Q20 - Would visible flooding in the imagery be a detriment to your use?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 27.69% | 18 |
| 2 | No | 72.31% | 47 |
| | Total | 100% | 65 |

## Q21 - Why is flooding during the flight an issue for your use?

| | |
|---|---|
| It could potentially obscure assets on the ground we are interested in. | hide surface conditions |
| Not a real issue but avoiding it would be preferable so that one can see the non-flood topography. | Gives false indication of wetland habitat |
| I would like the imagery to depict how the lay of the land is during a normal time, not impacted by a special event or disaster. | Could possibly obscure land surface details. |

| | |
|---|---|
| Standing water obstructs the ground surface. Utilize the photography for analysis and in lieu of site visits. Obstruction could render the photography useless in some areas. | We are observing ground disturbance and crop loss, the "white-out" effect from the reflection on the water would not be good |
| We are a beach community, so flood waters would make field users locating underground assets difficult for lack of onsite landmarks. | Does not represent baseline conditions |
| If we are trying to look at vegetation, we want the water levels to be low. However, for other applications and projects analyzing the flooding extent would actually be informative. | Our section manages floodplains, dams, waterways, shoreline change and coastal development. We need aerial imagery to provide baseline data for these issues. Similarly, having our entire coastal and waterways collected at the same tidal stage would be helpful |
| makes assessment of coastal and low-lying areas difficult | Not necessarily a problem but extensive flooding would obscure features of channel. |
| not an issue, flooding locations can be valuable information in mitigating flooding incidents. | obscures surface features |

## Q22 - Do you require tide-coordinated imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 24.62% | 16 |
| 2 | No | 75.38% | 49 |
| | Total | 100% | 65 |

## Q23 - What is your need for tide-coordination?

| | |
|---|---|
| Not knowing low vs high tide makes studying inundation patterns in coastal zones challenging. | Just need to know what it is/ Low tide could be helpful for specific projects |
| Just would be nice | Low tide for full habitat use |
| When delineating tidal wetlands vs non-tidal or even upland the imagery being consistent with the tide is very important. A current and hot topic is the idea of marsh migrating as sea levels rise, so tide coordination could be a vital piece of this idea. | To know what the tide is . . . For example, if shot at Mean Lower Low Water, then the shoreline is relative to MLLW |
| For the same reason above related to water levels in general... To maximize the view of vegetation and ground cover we want the water drained, but at times seeing the high tide extent would also be very informative. | aerial imagery should match DEM from lidar, which should be near low-tide |
| accuracy of surface conditions | We look at statewide shoreline change and changes in tidal channels for management decisions |

| | |
|---|---|
| shoreline delineation and shoreline change time series | Not an absolute necessity but helpful |
| Land area extent, elevation, land type (focused around tidal wetlands) | It is not necessary, but would be beneficial. If imagery was taken at the same tide stage every year, it would be easier to look at wetland trends along the coast to see if changes are due to erosion or accretion and not simply due to differences in tides. |
| To observe aquaculture sites at different tide conditions | |

## Q24 - Do you generate derivative products from the aerial imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 27.69% | 18 |
| 2 | No | 72.31% | 47 |
| | Total | 100% | 65 |

## Q25 - What products do you generate?

| | |
|---|---|
| Multiple dataset identify Park assets. | geomorphic feature boundaries |
| State wide and County Mr Sid. | Habitat maps |
| Spectral indices (e.g., NDVI, EVI) | wetland and restoration related |
| land use / land cover, parking spaces, building structures, etc. | Roof top geometry etc. |
| Tax Ditch Operations and Maintenance Maps and Drainage Program Solution Materials especially on FirstMap Tax Ditch and Drainage Concern Planner Maps and Apps | pET maps and areal assessments, water budget calculations |
| Marsh Migration model, wetland maps, high water line | Building Line maps |
| Land cover/vegetation maps | NLCD |
| other maps and contours | classification output, change detection productd |
| wetland/coastal migration areas | |

## Q26 - Do you digitize features using the aerial imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 61.54% | 40 |
| 2 | No | 38.46% | 25 |
| | Total | 100% | 65 |

## Q27 - What features do you digitize?

| | |
|---|---|
| vegetation growing in wetlands | HSI and location points |
| Trails and Pathways | infrastructure |
| Roadways, drainage features | dune lines, building footprints, vegetation stands, navigation channels, |
| Mainly polygons. | wetlands, forests, geological features |
| Building Footprints | homes |
| occasionaly parking spaces, point locations of items such as storm drains, buildings, etc. | shorelines |
| Parcel breakdown of Impervious vs. Pervious into different categories for Stormwater Rate calculation. | Carolina Bays, from a combination of aerials and LiDAR |
| In combination with LIDAR Spectrum layer we adjust tax ditch channel locations to more accurately reflect the LIDAR data and aerial presentation. | Location of structures and waterways |
| STRUCTURES | Impervious areas, forested areas and other land surface features. |
| Polygons, points, lines, and polylines (our engineers utilize the imagery as well) | River Channels |
| hoping to derive updated footprints | mostly infrastructure; occasionally boundaries |
| Structures such as dwellings, roads, barns, and other farm structures. | hydrography, roads, boundaries of vegetation, wetlands, coastal marsh, forests |
| Pedestrian assets. | MHW line, dunes, features along waterways, dam structures |
| Anything that needs to be digitized | Habitat for Element Occurrence records |
| We digitize historical maps and georeference them for network/infrastructure improvements and maintenance. | water features not in NHD, swamp/marsh areas within forested areas |
| wetlands, wildlife habitats | drainage features |
| Wetland boundaries, stream channel, project boundaries, project footprint | landscape features (e.g. roads, wetland boundaries, forest, etc.) |
| Very little of this, these days. But it's helpful for digitizing features on our wildlife refuge such as fields, trails, impoundments, etc. | building footprint, parks, |
| forest type and forest boundaries | The most popular would be build footprints but there are others. |
| point locations of historic properties, polygons of areas surveyed for archaeological sites and historic buildings and structures | Building structures, front door locations for address locations |

## Q28 - What if any horizontal accuracy does your data require?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | NAD 83 Horizonal datum | 50.77% | 33 |
| 2 | NAD 83 HARN Horizontal datum | 9.23% | 6 |
| 3 | WGS84 | 20.00% | 13 |
| 4 | Other (specify) | 20.00% | 13 |
| | Total | 100% | 65 |

## Q28 – Other horizontal accuracy (specify)

| |
|---|
| N/A Don't know, not sure (7 responses) |
| I am not sure, more accurate the better. |
| It does not require a specific datum. |
| We share image services in NAD 83 and WGS 84 to support our users. |
| we used NAVD 88 |
| these all work |

## Q29 - How else do you use the Aerial Imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Basemap/Background | 44.29% | 62 |
| 2 | Digitizing Data | 20.71% | 29 |
| 3 | In place of Field Verification | 30.00% | 42 |
| 4 | Other (specify) | 5.00% | 7 |
| | Total | 100% | 140 |

## Q29 – Other uses of imagery (specify)

| |
|---|
| 911 Response |
| Reference purposes |
| Coordinate verification |
| We host services so others can use the data without storing it |
| comparison tool for habitat changes |
| Help identify field sites to sample |
| Planning for fieldwork. Verifying wetland status and trends for watershed reports. |

## Q30 - What coordinate system do you require for the imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Delaware State Plane meters | 67.12% | 49 |
| 2 | Web Mercator | 10.96% | 8 |
| 3 | Other (specify) | 21.92% | 16 |
| | Total | 100% | 73 |

## Q30 – Other coordinate system (specify)

| |
|---|
| Delaware State Plane Feet (5 responses) |
| NAD 1983 UTM (2 responses)) |
| We serve the data in both systems |
| Does not matter (4 responses) |
| planar coordinates |
| Lat/Long |

## Q31 - Do you require a physical copy of the imagery tiles?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 12.31% | 8 |
| 2 | No | 87.69% | 57 |
| | Total | 100% | 65 |

## Q32 - What extent of a physical copy would you require?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Entire State | 55.56% | 5 |
| 2 | County | 33.33% | 3 |
| 3 | Smaller specific areas | 11.11% | 1 |
| 4 | Other (specify) | 0.00% | 0 |
| | Total | 100% | 9 |

## Q33 - What is the desired method of delivery for physical copies of imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Download from online source | 37.50% | 3 |
| 2 | Hard media (i.e. hard drive, flash drive, etc.) | 50.00% | 4 |
| 3 | Other (specify) | 12.50% | 1 |
| | Total | 100% | 8 |

## Q33 – Other delivery method (specify)

Doesn't really matter unless update frequency is so high that hard media becomes a burden

## Q34 - What format would be acceptable?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | GeoTIFF | 50.00% | 4 |
| 2 | MrSID | 25.00% | 2 |
| 3 | Other (specify) | 25.00% | 2 |
| | Total | 100% | 8 |

## Q34 – Other acceptable format (specify)

doesn't matter, but shouldn't be as large as 2017 imagery

# LiDAR Data Question Responses

## Q37 - Do you utilize the 3DEP airborne topographic, or airborne top/bathymetric LiDAR products?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 42.03% | 29 |
| 2 | No | 57.97% | 40 |
| | Total | 100% | 69 |

## Q38 - Which of the LiDAR products do you use?  (Check all that apply)

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Full Classified Point Cloud | 8.54% | 7 |
| 2 | Bare Earth (Last) Returns | 18.29% | 15 |
| 3 | Intensity Returns | 6.10% | 5 |
| 4 | Elevation Contours | 28.05% | 23 |
| 5 | Digital Elevation Model (DEM) | 32.93% | 27 |
| 6 | Breaklines | 3.66% | 3 |
| 7 | Other (specify) | 2.44% | 2 |
| | Total | 100% | 82 |

Q38 – Other LiDAR products used (specify)

| metadata | DSM |
|----------|-----|

## Q39 - Please list your top 3 use cases for topographic and/or topo/bathymetric LiDAR.

| | |
|---|---|
| Flood related (modeling analysis, mapping), Floodplain (modeling, inundation) - 8 respondents | Remote sensing of wildlife habitat, conservation planning |
| Topographic contour lines, elevations, use DEM - 6 respondents | Sewer placement, Pump Station Locations, Possible Spill Locations |
| Terrain and buildings (analysis, building footprints, base flood elevations, flood risk evaluation) - 6 respondents | General property discussion with public about water flow, septic areas, etc. |
| Shoreline evaluation (change estimates, orientation, identification, restoration opportunities/projects) - 6 respondents | create surfaces for HEC-RAS analysis. |
| Hydrologic (analysis, modeling, etc.) - 5 respondents | Extracting land-cover |
| Wetlands related uses (delineation, restoration opportunities, mitigation, etc.) - 5 respondents | Disaster Mitigation |
| Vegetation analysis and classification - 2 respondents | Agriculture |
| Building setbacks, building lines (coastal construction setbacks, ground vs Base Flood elevations) - 2 respondents | 1. Tax Ditch and Drainage Concern Response maps rely on the DEM Spectral overlayed with drainage features. These maps have been a real time and money savings in responding to the drainage concerns in Delaware. 2. Full LIDAR point cloud used for UAV planning for Tax Ditch/Drainage Concern Response Inspection Flights. 3. Full LIDAR point cloud used for updating Tax Ditch Operations and Maintenance Plans. |

## Q40 - What is your preferred frequency of updating LiDAR?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | 2 year intervals | 37.93% | 11 |
| 2 | 3 year intervals | 17.24% | 5 |
| 3 | 4 year intervals | 6.90% | 2 |
| 4 | 5 year intervals | 31.03% | 9 |
| 5 | 8 year intervals | 6.90% | 2 |
| | Total | 100% | 29 |

**Q41 - The latest USGS LiDAR spec is our standard - Quality Level 2 (QL2) for topographic lidar which is 10cm vertical RMSE & 2 points/square meter.      Does your program require higher resolution products at increased cost?**

| # | Answer | % | Count |
|---|--------|------|-------|
| 1 | Yes | 13.79% | 4 |
| 2 | No | 86.21% | 25 |
|   | Total | 100% | 29 |

**Q42 - What Quality level is of use to your agency/program?**

| # | Answer | % | Count |
|---|--------|------|-------|
| 1 | Quality Level 1=10cm vertical RMSE & 8 points/square meter. | 25.00% | 1 |
| 2 | Quality Level 0 draft spec=5cm vertical RMSE & 16 points/square meter. | 25.00% | 1 |
| 3 | Other (specify) | 50.00% | 2 |
|   | Total | 100% | 4 |

Q42 – Other quality level (specify)

I'm not knowledgeable enough to say, but improve accuracy is best for tidal marshes; We would only need/expect that in coastal settings

**Q43 - Is Tidal Coordination of the LiDAR capture important to your work?**

| # | Answer | % | Count |
|---|--------|------|-------|
| 1 | Yes | 37.93% | 11 |
| 2 | No | 62.07% | 18 |
|   | Total | 100% | 29 |

## Q44 - Explain your programmatic need for tidal coordination.

| | |
|---|---|
| We are actively trying to improve LIDAR accuracy in tidal marshes, and having measurements at low tide is very helpful for this. | The better the tide coordination, the better our program can determine shoreline condition and wetland/upland interface. |
| Our interest is in tidal settings, so low tide is the best way to maximize exposure of vegetation and bare ground | Accurate hydrology determinations and intertidal wetland elevations |
| beach area topobathy, shoreline delineation from elevation data | consistency so can look at habitat extent and habitat type |
| ideal to have at low tide | Delineating coastal features and shorelines |
| To understand shoreline elevations | shoreline mapping |
| coastal flood inundation, impacts of slr | |

## Q45 - What are your tide coordination requirements? (i.e. +/- 2 hours from low tide)

| | |
|---|---|
| 2 hours is fine - 2 respondents | Within a couple hours of low tide |
| As close to the low tide is best. - 2 respondents | +/- 1 hour from high or low tide |
| +/-2 hours should work - 2 respondents | Low tide |
| +1/-2 hours | yes |
| best as possible | |

## Q46 - Do you need a physical copy of the LAS data files?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 17.24% | 5 |
| 2 | No | 82.76% | 24 |
| | Total | 100% | 29 |

## Q47 - If Yes, please explain.

| | |
|---|---|
| We do a fair amount of processing to look at surface characteristics from the raw point clouds. | FirstMap will need a physical copy in order to create the services for others to use. |
| We would want the raw data for our project area, when possible | Would like to store locally if storage space available |
| to add SLR data | |

## Q48 - Do you utilize Lidar data aside from the publicly accessible statewide collection?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 31.03% | 9 |
| 2 | No | 68.97% | 20 |
| | Total | 100% | 29 |

## Q49 - What product do you use?

| | |
|---|---|
| Drone2Map-generated point cloud data which is not LIDAR, but thought good to mention. | Drone-collected or paid contractor LiDAR have been used by us in recent years |
| Drone based lidar | USGS |
| USACE NCMP, USGS CoNED, NOAA NGS post-Sandy | various |
| GEDI (space LiDAR) | any that meets 3DEP spec |
| DGS housed copy | |

## Q50 - What is the reason for using this LiDAR product? Select all that apply

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Statewide data not current/frequent enough | 30.77% | 4 |
| 2 | Special Program/Project need | 53.85% | 7 |
| 3 | Other (specify) | 15.38% | 2 |
| | Total | 100% | 13 |

## Q50 - Other reason for using different LiDAR product (specify)

| | |
|---|---|
| speed of rendering | additional data |

## Q51 - How do you access this other LiDAR data? Select all that apply

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Hosted by Vendor | 0.00% | 0 |
| 2 | Online Application | 30.00% | 3 |
| 3 | Other (specify) | 70.00% | 7 |
| | Total | 100% | 10 |

## Q51 – Other access to LiDAR (specify)

| | |
|---|---|
| Drone2Map point cloud (NOT LIDAR) | Hosted in house. |
| Provided to us | misc |
| Will be delivered by contractor | elevation data portals |
| Academic | |

## Q52 - Would you use LIDAR for assessing vegetation structure?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 37.93% | 11 |
| 2 | No | 62.07% | 18 |
| | Total | 100% | 29 |

## Q53 - Would multispectral LIDAR be useful for your work?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 48.28% | 14 |
| 2 | No | 51.72% | 15 |
| | Total | 100% | 29 |

## Q54 - Explain your programmatic use/need for multispectral LiDAR.

| | |
|---|---|
| Multispectral LIDAR contains a wealth of information on surface reflectivity at different wavelengths, which has the potential to aid ecology and hydrology research. | While our program does not use this currently, it is something that is of interest.  Multispectral could provide our program with an opportunity to fine tune wetland research based off vegetation. |

| | |
|---|---|
| This potential use / need involves looking for invasive species within tax ditch channels. LIDAR classified by vegetation types that utilize multispectral analysis with ground truthed information at high resolution could help map and generate plans to deal with removal. Possible use if available... | I don't know what it is, exactly, but since we use LiDAR and multispectral imagery for vegetation classification (or, I should say agency GIS specialists do it for us with available data), this sounds like a good product. |
| we do not currently have a workflow that requires it, but could perform dune vegetation assessments using multispectral | vegetation mapping, vegetation health - 4 respondants |
| improved usability in areas of little relief | topo/bathy |
| land cover identification | |

# Land Use Land Cover Data Question Responses

## Q56 - Do you utilize the statewide Land Use Land Cover dataset?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 60.87% | 42 |
| 2 | No | 39.13% | 27 |
| | Total | 100% | 69 |

## Q57 - Is the 3-digit Anderson et.al. Classification schema sufficient for your use?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 97.62% | 41 |
| 2 | No | 2.38% | 1 |
| | Total | 100% | 42 |

## Q58 - If No, What Classification schema would work better for you?

My work would benefit a lot from finer-grain info (breaking down some of the classes), but we use it as is because it is what is available.

## Q59 - The Minimum Mapping Unit (MMU) for LULC is ¼ acre for wetlands and 2 acres for uplands.  Is this MMU sufficient for your use?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 90.48% | 38 |
| 2 | No | 9.52% | 4 |
| | Total | 100% | 42 |

## Q60 - If No, What MMU do you need?

| |
|---|
| Residential classes from recent LULC (AIS) 1/4 acre |
| 1 acre upland - 2 respondents |
| Be nice to have 1/4 acre for all |

## Q61 - What is your preferred frequency of updating Land Use Land Cover dataset?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yearly | 23.81% | 10 |
| 2 | 2 year interval | 33.33% | 14 |
| 3 | 3 year interval | 14.29% | 6 |
| 4 | 4 year interval | 9.52% | 4 |
| 5 | 5 year interval | 19.05% | 8 |
| | Total | 100% | 42 |

## Q62 - Do you use other LULC datasets besides the ones collected by Delaware?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 23.19% | 16 |
| 2 | No | 76.81% | 53 |
| | Total | 100% | 69 |

## Q63 - What other LULC sources do you utilize?

| | |
|---|---|
| National Land Cover Dataset - 5 respondents | NOAA C-CAP (its a land use land change product) |
| Chesapeake Conservancy - 3 respondents | USDA |
| In-house generated for site specific engineering related plans for resolving tax ditch and drainage concern issues. | I believe FirstMap also serves the LULC data created by the University of Vermont.  If we do not we probably should.  Some users have asked for it. |
| NRCS National Cooperative Soil Survey | other states |
| We have several refuge-specific vegetation/landcover map products from recent years.  Or, in the case of the SHARP high/low marsh layer, it's regionwide and specific to our needs (but also not accurate enough...) | Don't have the specific information available |

## Q64 - What is the reason for using other LULC sources? Select all that apply

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Statewide data not current/frequent enough | 18.75% | 3 |
| 2 | Special Program/Project need | 50.00% | 8 |
| 3 | Other (specify) | 31.25% | 5 |
| | Total | 100% | 16 |

## Q64 – Other reason for using other LULC (specify)

| | |
|---|---|
| finer resolution on one source, and ease of access when working across multiple states for national | misc, federal product/NLCD high quality standard and consistent |
| Standardized across entire country | better scale for analysis |

## Q65 - What vendor/agency provides this product?

| | |
|---|---|
| Multi-resolution land characteristics consortium https://www.mrlc.gov/ | SHARP marsh type mapping; Sewall for forest type mapping |
| In-house planner | Chesapeake Bay Program/USGS |
| NRCS | USDA |
| University of Vermont/Chesapeake Conservancy - 3 respondents | Don't have the specific information available |
| NOAA | MRLC |
| many | |

# Impervious Surface Data Question Responses

## Q73 - Do you use the Impervious Surface Data?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 36.23% | 25 |
| 2 | No | 63.77% | 44 |
| | Total | 100% | 69 |

## Q74 - How do you utilize the Impervious Surface Data?

| | |
|---|---|
| I don't use it much, but I use it sometimes for determining how much impervious surface is within a watershed. | For Tax Ditch and Drainage Concern responses. This data is a part of the process for designing pipe sizes and providing required statistics on related applications. |
| may use in future to characterize human impact | Hydrology modeling |
| ENGINEERING REVIEWS | Calculate the impervious surface for selected parcels |
| Stormwater engineering requirements related to transportation projects. | Determine runoff amounts, support municipal code development |
| Helps judge development | Community analysis |
| Classifying or reclassifying urban/suburban habitats. | change, barriers to wetland migration, flooding |
| I use this layer in conjunction with the LULC layer | Will use it for watershed planning. |
| Stormwater runoff, etc. | Wellhead Protection |
| Determining runoff curve number to generate amount of stormwater runoff | We use it to estimate costs for restoration in future construction projects. |
| For regulatory applications. | To review SWM designs. |
| For mannings n/ runoff calculations | Identify areas of covered surface |
| We use impervious surface data to calculate the percentage of a property that is covered by impervious surfaces as part of a requirement for funding by NRCS. We often need to correct the current impervious surface data to get a more accurate depiction of impervious coverage from small farm structures like sheds and barns. | Used occasionally for desktop watershed or stream analyses. |

## Q75 - The Minimum Mapping Unit (MMU) for Impervious Surface is 2 acres.  Is this MMU sufficient for your use?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 80.00% | 20 |
| 2 | No | 20.00% | 5 |
| | Total | 100% | 25 |

## Q76 - What MMU would suit the needs of your program?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | 1 acre | 0.00% | 0 |
| 2 | 0.5 acre | 20.00% | 1 |
| 3 | 0.25 acre | 60.00% | 3 |
| 4 | Other (specify) | 20.00% | 1 |
| | Total | 100% | 5 |

## Q76 – Other MMU needs (specify)

as small as possible, to be useful for looking at changes in urban areas

## Q77 - What is your preferred frequency of updating Impervious Surface Data?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yearly | 12.00% | 3 |
| 2 | 2 year interval | 52.00% | 13 |
| 3 | 3 year interval | 4.00% | 1 |
| 4 | 4 year interval | 8.00% | 2 |
| 5 | 5 year interval | 24.00% | 6 |
| | Total | 100% | 25 |

## Q78 - Do you use other Impervious Surface datasets besides the ones collected by Delaware?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 4.35% | 3 |
| 2 | No | 95.65% | 66 |
| | Total | 100% | 69 |

## Q79 - What other Impervious Service datasets do you utilize?

| | |
|---|---|
| National Land Cover Dataset - Impervious Surfaces | Impervious cover on USGS StreamStats |
| USDA | |

## Q80 - What is the reason for using other Impervious Service datasets? Select all that apply

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Statewide data not current/frequent enough | 0.00% | 0 |
| 2 | Special Program/Project need | 33.33% | 1 |
| 3 | Other (specify) | 66.67% | 2 |
| | Total | 100% | 3 |

Q80 Other reason for using other Impervious Surface data (specify)

| | |
|---|---|
| Standardized across entire country | StreamStats includes impervious cover and other metrics that we need |

## Q81 - What vendor/agency provides this product?

| | |
|---|---|
| USDA | https://www.mrlc.gov/ |
| USGS | |

## Aerial Imagery Data Section

## Q86 - Does your agency/group/section utilize the statewide publicly available aerial imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 91.67% | 11 |
| 2 | No | 8.33% | 1 |
| | Total | 100% | 12 |

## Q87 - Does your agency/group/section purchase aerial imagery products aside from the publicly accessible statewide aerial imagery?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 33.33% | 4 |
| 2 | No | 66.67% | 8 |
| | Total | 100% | 12 |

## Q88 - What product do you purchase?

| | |
|---|---|
| PICTOMETRY/EAGLEVIEW | High resolution sampling of State Parks |
| Air Force performs the purchase for us. | NAIP |

## Q89 - What is the Cost of this purchase?

| | |
|---|---|
| ~$73,000/TWO YEARS | $25k (just a guess) |
| Not sure | USGS funds an annual amount to USDA |

## Q90 - What is the reason for purchasing? Select all that apply

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Statewide data not current/frequent enough | 16.67% | 1 |
| 2 | Special Program/Project need | 33.33% | 2 |
| 3 | Other (specify) | 50.00% | 3 |
| | Total | 100% | 6 |

## Q90 – Other reason for purchasing (specify)

| | |
|---|---|
| OBLIQUE IMAGERY ONLINE | NAIP used in conjunction with the National Map |
| quality imagery is worth the cost | |

## Q91 - Does your contract permit you to share this product publicly?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 75.00% | 3 |
| 2 | No | 25.00% | 1 |
| | Total | 100% | 4 |

## Q92 - What is the constraint for sharing the data publicly?

We are only allowed to share with Gov Agencies.**Q93 - Preferred aerial imagery acquisition method - Select all that apply**

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Subscription | 7.14% | 1 |
| 2 | Licensing | 0.00% | 0 |
| 3 | Purchase | 28.57% | 4 |
| 4 | No opinion | 42.86% | 6 |
| 5 | Other (specify) | 21.43% | 3 |
| | Total | 100% | 14 |

## Q93 – Other preferred imagery acquisition method (specify)

| | |
|---|---|
| This would be more of a funding issue and decided at the Finance level on if they're willing to do recurring.  With the mandatory re-assement coming up I think it is more likely funding will open up. | I'm not familiar with the benefits of each so no opinion |
| | Government funded/public access |

## Q94 - What funding sources does your agency/group/section have available to contribute to a multi-agency purchase of aerial imagery? Select all that apply.

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Grant Funds | 15.38% | 2 |
| 2 | Program Funds | 15.38% | 2 |
| 3 | State Funds | 0.00% | 0 |
| 4 | No funds available | 23.08% | 3 |
| 5 | Other (specify) | 46.15% | 6 |
| | Total | 100% | 13 |

## Q94 – Other funding sources (specify)

| | |
|---|---|
| None at this time but again the mandatory reassessment will change everything. | No fund currently, but if need is determined we could put it in future budget requests |
| Normally program funds but this source may be currently limited due to funding cuts. | not sure about availability but would budget for this expense. |
| Federal | The division may be able to assist with a combination of ASF and NSF funds |

## Q96 - Does your agency/group/section utilize the statewide publicly available 3DEP airborne topographic, or airborne top/bathymetric LiDAR products?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 66.67% | 8 |
| 2 | No | 33.33% | 4 |
| | Total | 100% | 12 |

## Q97 - Does your agency/group/section purchase LiDAR aside from the publicly accessible statewide collection?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 16.67% | 2 |
| 2 | No | 83.33% | 10 |
| | Total | 100% | 12 |

## Q98 - What product do you purchase?

| Have contracted for supplemental Lidar in past for special projects | Topo-LiDAR |
|---|---|

## Q99 - What is the Cost of this purchase?

| Unsure | ~$75K |
|---|---|

## Q100 - What is the reason for purchasing? Select all that apply.

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Statewide data not current/frequent enough | 0.00% | 0 |
| 2 | Special Program/Project need | 50.00% | 1 |
| 3 | Other (specify) | 50.00% | 1 |
| | Total | 100% | 2 |

## Q100 - Other reason for purchasing (specify)

Accuracy of statewide at time

## Q101 - Does your contract permit you to share this product publicly?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 50.00% | 1 |
| 2 | No | 50.00% | 1 |
| | Total | 100% | 2 |

## Q102 - What is the constraint for sharing the data publicly?

Federal Policy

## Q103 - What funding sources does your agency/group/section have available to contribute to a multi-agency statewide purchase of topographic or topo/bathymetric LiDAR? Select all that apply.

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Grant Funds | 13.33% | 2 |
| 2 | Program Funds | 20.00% | 3 |
| 3 | State Funds | 6.67% | 1 |
| 4 | No funds available | 26.67% | 4 |
| 5 | Other (specify) | 33.33% | 5 |
| | Total | 100% | 15 |

## Q103 - Other funding sources (specify)

| | |
|---|---|
| contours are the only product currently used or needed | None at this time, but if need is warranted we could put in future budget requests |
| Program funds are currently limited due to funding cuts | I would have to know that we would utilize these datasets prior |
| Federal | |

## Land Use Land Cover Data Section

## Q105 - Does your agency/group/section utilize the statewide publicly available Land Use Land Cover (LULC) dataset?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 83.33% | 10 |
| 2 | No | 16.67% | 2 |
| | Total | 100% | 12 |

## Q106 - Does your agency/group/section use other LULC datasets besides the statewide publicly available LULC?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 8.33% | 1 |
| 2 | No | 91.67% | 11 |
| | Total | 100% | 12 |

## Q107 - What LULC dataset do you use?

NLCD, Chesapeake Bay LC Change Data

## Q108 - Did you purchase this LULC dataset?

| # | Answer | % | Count |
|---|--------|---|-------|
| 1 | Yes | 0.00% | 0 |
| 2 | No | 100.00% | 1 |
| | Total | 100% | 1 |

**Q113 - What funding sources does your agency/group/section have available to contribute to a multi-agency purchase of Land Use Land Cover dataset? Select all that apply.**

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Grant Funds | 14.29% | 2 |
| 2 | Program Funds | 21.43% | 3 |
| 3 | State Funds | 0.00% | 0 |
| 4 | No funds available | 35.71% | 5 |
| 5 | Other (specify) | 28.57% | 4 |
| | Total | 100% | 14 |

## Q113 – Other funding sources (specify)

| | |
|---|---|
| I will forward survey to PZ director to see if he has better answers for this section than I am aware of. | Federal |
| Program funds may be limited due to funding cuts. | combination of asf nsf |

## Impervious Surface Data Section

### Q115 - Does your agency/group/section utilize the statewide publicly available Impervious Surface dataset?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 41.67% | 5 |
| 2 | No | 58.33% | 7 |
| | Total | 100% | 12 |

### Q116 - Does your agency/group/section use other Impervious Surface datasets besides the statewide publicly available Impervious Surface dataset?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 8.33% | 1 |
| 2 | No | 91.67% | 11 |
| | Total | 100% | 12 |

### Q117 - What other Impervious Surface dataset do you use?

Chesapeake Bay Land Cover Change, NLCD

### Q118 - Did you purchase this other Impervious Surface dataset?

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 0.00% | 0 |
| 2 | No | 100.00% | 1 |
| | Total | 100% | 1 |

**Q123 - What funding sources does your agency/group/section have available to contribute to a multi-agency purchase of an Impervious Surface dataset? Select all that apply.**

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Grant Funds | 7.69% | 1 |
| 2 | Program Funds | 15.38% | 2 |
| 3 | State Funds | 0.00% | 0 |
| 4 | No funds available | 46.15% | 6 |
| 5 | Other (specify) | 30.77% | 4 |
| | Total | 100% | 13 |

Q123 - Other funding sources (specify)

| | |
|---|---|
| Again this is a PZ specific question | Ferderal |
| Program funds may be limited due to funding cuts. | asf nsf |

**Q124 - As a manager are you interested in taking the Technical Specifications Survey for the datasets? If you answer yes, you will be sent to that survey.**

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Yes | 50.00% | 6 |
| 2 | No | 50.00% | 6 |
| | Total | 100% | 12 |